UCRL-JC-125665 Abs

Method for producing sol-gel silica glass in the refractive index range from 1.08 to 1.18*

John F. Poco and Lawrence W. Hrubesh
Chemistry & Materials Science Directorate
Lawrence Livermore National Laboratory
Livermore, CA 94550

Optical quality glasses with selective refractive indexes between 1.08 and 1.18, are needed for certain Cerenkov detector applications. It is generally difficult to produce sol-gel glasses in this index range because the porosity is difficult to control and the optical clarity is usually poor for evaporatively dried or sintered gels. We have developed a sol-gel process for silica that produces optically clear glass in the proper porosity range for this range of refractive indexes. The method involves drying sol-gels both by evaporation and by supercritical liquid extraction. This process can be controlled to produce glass having a selected refractive index. This paper describes the method and presents optical characterization data for the sol-gel silica glasses.

*Work performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.